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Abstract: Objective: Concomitant skin conditions may be neglected in internal medicine patients due to lack of knowledge or resources. Thus, we investigated the prevalence of undiagnosed skin conditions in this population. Methods: 200 patients in a university medical center's internal medicine division were examined clinically for dermatoses and quality of life in a prospective, 2-month, single-center study. Results: All patients had several dermatological problems (mean per patient: 13; range: 3-25). There was no relationship between the patient's main medical problem and the number or nature of dermatological conditions. Most patients (84%) requested treatment for their skin condition during hospitalization, especially for xerosis (76%), warts (69%), seborrheic eczema (67%) and onychorrhexis (53%) but not for asymptomatic dermatoses. The impairment in skin-related quality of life was mild but significant, with a mean \pm SD Dermatology Life Quality Index of 3 ± 4 ($p < 0.001$), and global quality of life impairment was severe ($p < 0.001$). Conclusions: Inpatients suffered from many different, mostly age-related, skin conditions that remained undiagnosed. When prompted, however, patients requested treatment, particularly for symptomatic dermatological conditions such as xerosis, revealing an unmet need that needs to be addressed by qualified evaluation and care.

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Acutely Ill Patients in Internal Medicine Departments Want Treatment for Undiagnosed, Symptomatic Skin Conditions

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Key Words

Skin care • Dermatoses • Internal medicine • Prevalence • Quality of life

Abstract

Objective: Concomitant skin conditions may be neglected in internal medicine patients due to lack of knowledge or resources. Thus, we investigated the prevalence of undiagnosed skin conditions in this population. **Methods:** 200 patients in a university medical center's internal medicine division were examined clinically for dermatoses and quality of life in a prospective, 2-month, single-center study. **Results:** All patients had several dermatological problems (mean per patient: 13; range: 3–25). There was no relationship between the patient's main medical problem and the number or nature of dermatological conditions. Most patients (84%) requested treatment for their skin condition during hospitalization, especially for xerosis (76%), warts (69%), seborrheic eczema (67%) and onychorrhexis (53%) but not for asymptomatic dermatoses. The impairment in skin-related quality of life was mild but significant, with a mean \pm SD Dermatology Life Quality Index of 3 ± 4 ($p < 0.001$), and global quality of life impairment was severe ($p < 0.001$). **Conclusions:**

Inpatients suffered from many different, mostly age-related, skin conditions that remained undiagnosed. When prompted, however, patients requested treatment, particularly for symptomatic dermatological conditions such as xerosis, revealing an unmet need that needs to be addressed by qualified evaluation and care.

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Introduction

Internal medicine divisions generally diagnose and treat patients with a wide range of internal organ diseases. Most internal medicine patients have one or more main complaints and a variety of secondary problems (including skin conditions) [1, 2]. However, the current importance of cost-effectiveness has prompted debate as to whether all of a patient's various medical problems should be addressed during hospitalization. Some physicians believe that focusing therapy on the main complaint is most important. In contrast, a carefully weighted evaluation and treatment of multimorbid relevant medical problems of patients is the traditional mandate (and the art) of internal medicine. Since some secondary prob-

lems do not fall within the spectrum of internal medicine, other specialists may be consulted as a function of the perceived disease severity. However, this can be done only for a limited number of problems; the rest have to be addressed later or, in some cases, not at all. The latter approach may lead to the neglect of inconspicuous or apparently mild dermatological conditions. Hence, in the present study, we sought to apply the dermatologist's specialist knowledge to an internal medicine division and prospectively evaluated the prevalence of skin conditions and their impact on the quality of life of the patients. Further, we evaluated whether the prevalence of dermatological conditions in internal medicine inpatients was correctly recorded on admission.

The objective of the present study was to accurately assess the true prevalence of dermatological conditions in inpatients in a university medical center's internal medicine division. We also sought to measure the impairment in global and skin-related quality of life and to determine the extent to which patients wished to receive treatment for their dermatological conditions.

Patients and Methods

Setting

The University Hospital Zurich comprises 40 departments and institutes and serves around 200,000 patients each year. The Internal Medicine Division provides in- and outpatient diagnostic services and care for individuals with nonspecific symptoms, complex disease patterns and multiple diseases. The division includes an emergency unit, an outpatient clinic, several wards (with about 60 beds in all) and an intensive care unit. In 2009, the division of internal medicine treated more than 1,600 inpatients.

In Switzerland, all patients have universal healthcare coverage, including adults with low income who receive social aid to cover healthcare costs, regardless of their age or whether they work. Patients are free to choose their primary care physician (GP) and can schedule appointments with specialists without referral being required.

Subjects and Design

This cross-sectional, prospective study was approved by the local institutional review board (Kantonale Ethikkommission Zürich: 2009-1753; clinicaltrials.gov: NCT01044043). From December 1, 2009 to January 31, 2010 patients in the division of internal medicine were invited to participate in a free, 15-min dermatological examination and quality of life analysis administered by the study physicians (Y.G. and A.A.N.). The digital photographs used to document the diseases were stored in a secure, electronic medical records system (KISIM; CISTEC AG, Zurich, Switzerland). Uncertain diagnoses were discussed by two experienced dermatologists (R.B. and A.A.N.) until a consensus was reached. Microbiological and mycological tests, biopsies and other investigations were recommended to the attending physicians

but did not form part of the present study. Since our recommendations were not always followed, our diagnoses had to remain essentially descriptive. For example, onychodystrophy cannot be differentiated from onychomycosis in the absence of mycological testing. Before the examination, all the patients were asked whether they knowingly suffered from one or more skin problems. After the examination, the patients were told which conditions had been identified and were asked whether they wished to receive treatment accordingly. The first 100 patients were asked a general question on whether they wished to receive dermatological treatment. The second 100 patients were specifically asked about which skin condition(s) should or should not be treated.

We looked for dermatological conditions specifically related to the use of certain drugs (e.g. lipid-lowering drugs have been associated with lipid disorders of the skin such as xerosis cutis and exsiccation eczema [3]) and sought to identify overrepresentation of some dermatoses in subspecialties of internal medicine (e.g. telangiectasia in gastroenterology patients). Lastly, we looked for gender differences.

Quality of Life

To measure global quality of life, we administered the widely used 8-item SF-12 questionnaire (normative score: 50) comprising a physical and a mental component score [4]. To measure a specific impairment in quality of life by dermatological disease, the patients filled in the 10-item Dermatology Life Quality Index (DLQI, normative score: 1.6) [5]. Data from our patients were compared to a normative population. The questionnaires used are in the German language and have both been formally validated [4, 6].

Statistical Analyses

Statistical analyses (linear regression, correlation, two-sided t tests for independent samples and χ^2 tests) were performed with GraphPad Prism 5 (GraphPad Software, La Jolla, Calif., USA) and SPSS 18 (IBM Corp., Somers, N.Y., USA) software. The threshold for statistical significance was set to $p < 0.05$. Normally distributed data were expressed as the mean \pm SD.

Role of the Funding Source

This study was funded by the Department of Dermatology and the Division of Internal Medicine, Zurich University Hospital. Both entities were involved in the study design, performance and reporting.

Results

In all, 226 patients were invited to participate in the study; 26 (11%) refused for various reasons. Hence, 200 patients (134 men and 66 women; age, mean \pm SD: 61 \pm 16 years) were included. For 64% of the study participants, no skin changes had been recorded on admission to hospital.

Prevalence of Dermatological Conditions

The dermatological examination identified an average of 13 \pm 4 (range: 3–25) skin conditions per patient – 24

times more cases than had been recorded on admission. The number of dermatological diagnoses correlated with age ($p < 0.0001$; fig. 1). A total of 157 different dermatological conditions were identified. The 8 most commonly encountered were seborrheic keratosis (affecting 70% of patients), lentigo (70%), androgenetic alopecia (68%), xerosis cutis (64%), melanocytic nevi (62%), cherry hemangioma (58%), telangiectasia (55%) and solar elastosis (44%) (fig. 2). Of the 152 diagnoses of xerosis cutis, only 10 had been identified at admission and none had received treatment during the hospital stay.

Of the patients with xerosis cutis, 76% wished to receive treatment for the condition (fig. 2). All the patients with prurigo requested dermatological treatment. The corresponding values were 67% for seborrheic eczema, 69% for warts, 53% for onychorrhexis, 28% for onychodystrophy/onychomycosis, 32% for sebaceous gland hyperplasia and 25% for hirsutism/hypertrichosis, but only 5% for seborrheic keratosis, 3% for lentigo, 2% for telangiectasia, 1.5% for cherry hemangioma and 0% for poikiloderma of Civatte.

Distribution of Dermatoses

Several dermatoses are known to be associated with particular internal diseases. We specifically looked for spider nevi, telangiectasia, pruriginous lesions, jaundice and palmar erythema (as seen in liver failure), clubbing and hourglass fingernails (as associated with pulmonary or cardiac disease), pseudoacanthosis nigricans, rubor diabeticorum, Huntley's papules (diabetes mellitus) and many others. However, none of these dermatoses was specifically associated with underlying internal diseases (not shown). When the patients were grouped according to underlying internal disease by ICD-10 code, the number of dermatoses per patient did not vary significantly. Twenty-seven percent of our patients had a circulatory system disease (ICD-10, chapter IX, block I00-I99), 17% had a digestive system disease (chapter XI, block K00-K93) and 14% had an infectious or parasitic disease (chapter I, block A00-B99) (online supplementary fig. 1; for all online supplementary material, see www.karger.com/doi/10.1159/000342177). Furthermore, we did not observe a significant association between drugs and dermatoses (e.g. between lipid-lowering drugs and xerosis; data not shown).

Some dermatological conditions were associated with gender. Unsurprisingly, androgenetic alopecia was more prevalent in males (95%) than in females (14%) ($p < 0.001$) (fig. 3). Furthermore, poikiloderma of Civatte ($M = 46\%$; $F = 15\%$; $p < 0.001$) and nevi ($M = 70\%$; $F = 44\%$; $p < 0.05$)

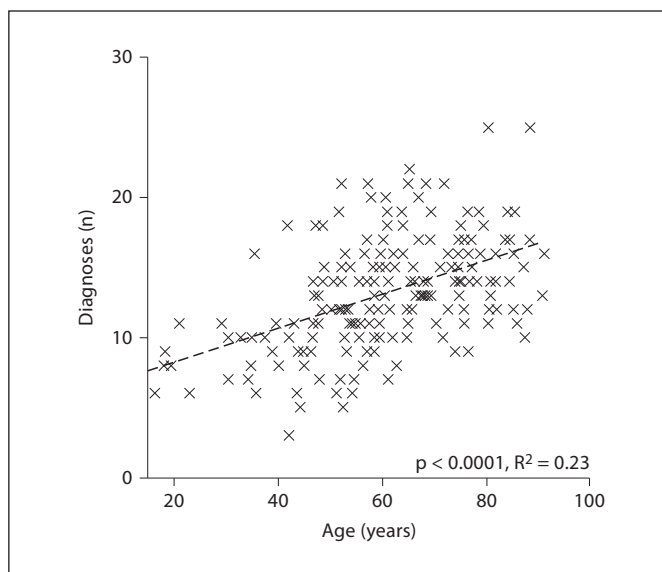


Fig. 1. The number of diagnosed dermatological conditions per patient plotted against the patient's age. The correlation was statistically significant ($p < 0.0001$, $R^2 = 0.23$).

were more often diagnosed in men than in women. In women, hypertrichosis ($F = 30\%$; $M = 1\%$; $p < 0.001$) was more prevalent than in men. The prevalence of onychorrhexis ($F = 14\%$; $M = 7\%$; NS), telangiectasia ($F = 67\%$; $M = 49\%$; NS), seborrheic keratosis ($F = 65\%$; $M = 72\%$; NS), lentigo ($F = 77\%$; $M = 66\%$; NS) and xerosis cutis ($F = 65\%$; $M = 63\%$; NS) did not appear to be gender-related. In 10 patients (5%), we recommended a biopsy or close clinical monitoring of a putative, malignant skin tumor. Given that the present study was limited to clinical examination, tumor types were not reported separately.

Impairments in Skin-Related and Global Quality of Life

The skin-related quality of life impairment was mild, with a mean DLQI of 3 ± 4 ($p < 0.001$ vs. normative data). The physical quality of life impairment was severe, with an SF-12 PCS of 33 ± 11 ($p < 0.001$ vs. normative data). The mental quality of life impairment was mild but significant, with an SF-12 score of 47 ± 12 ($p < 0.001$ vs. normative data) [4]. Seventeen percent of patients stated that they were aware of at least 1 of their dermatological conditions prior to the examination; these individuals had skin-related quality of life impairment (fig. 4). After being informed about the dermatological findings, 84% of the patients stated their wish to receive treatment. The

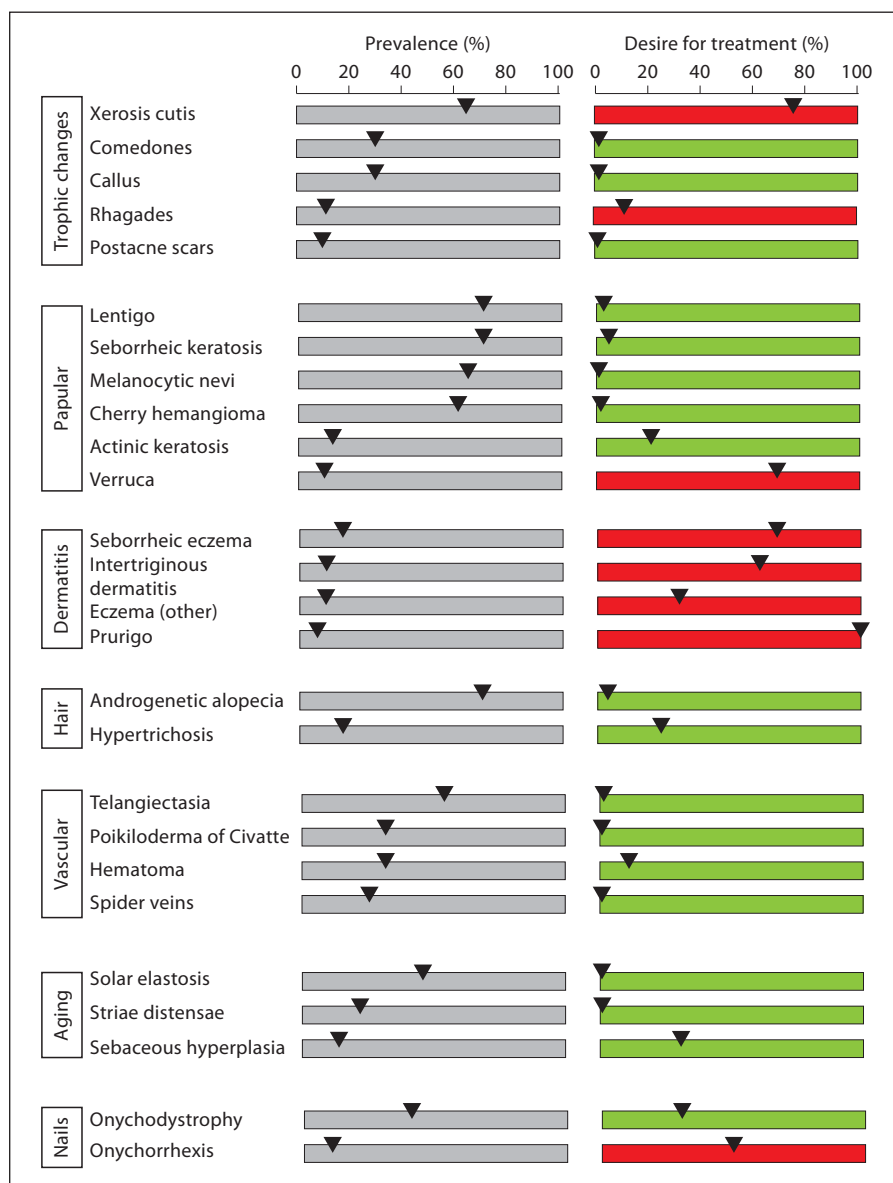


Fig. 2. The prevalence of dermatoses (left column) and the wish for treatment (right column) in affected patients. Right column: dark grey (red) and light grey (green) bars indicate symptomatic and asymptomatic dermatoses, respectively.

proportion was significantly higher for symptomatic dermatoses than for cosmetic or other asymptomatic skin problems ($p < 0.001$, as shown in fig. 2). When the patients were asked whether they would have wished to be treated for the skin problems if they had been in generally good health, the value rose to 90%. The patients not wishing to receive dermatological treatment (17%) indicated that they did not believe that skin problems were present, that other medical conditions were more pressing and/or that they were afraid of a long series of dermatological follow-up visits. Although the DLQI score was higher in patients who were aware of dermatological con-

ditions prior to admission, the average number of dermatoses was the same (data not shown). To establish whether more severely ill patients tended to neglect their skin conditions and decline skin-specific therapy, we compared the wish of the patients for dermatological treatment with their physical quality of life data but did not find a significant correlation (fig. 5). Similarly, the patients still expressed a wish for treatment when asked to imagine that their other health problems were nonexistent (online supplementary fig. 2).

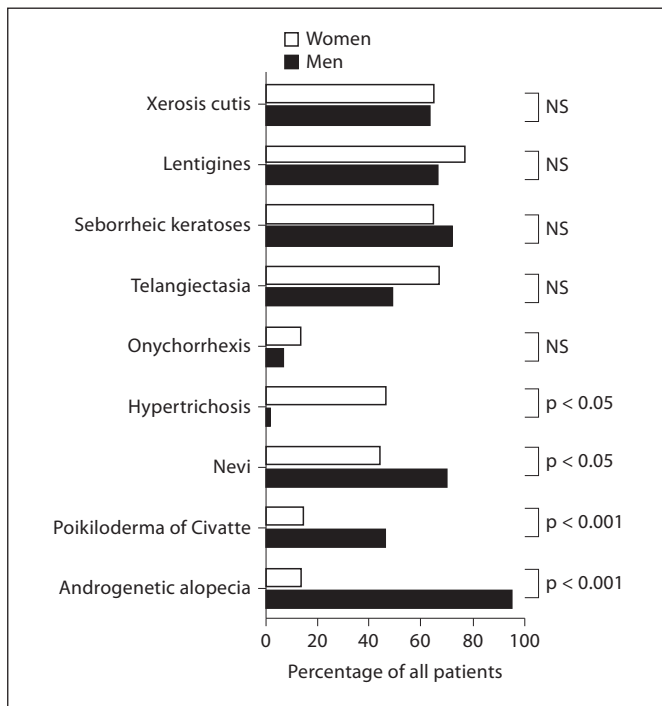


Fig. 3. The gender distribution of selected dermatoses. Statistically significant differences were observed for androgenetic alopecia, nevi, poikiloderma of Civatte and hypertrichosis.

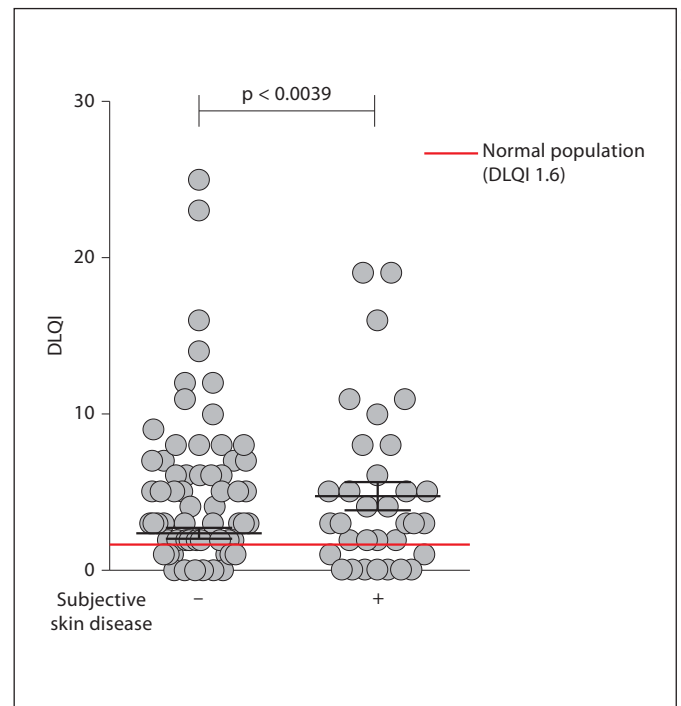


Fig. 4. The individual DLQI values for patients who were aware of their skin disease prior to admission (left) or not (right). The mean DLQI in a normal population is 1.6 (grey/red line).

Discussion

The results of the present study showed that undiagnosed dermatological problems (largely unrelated to internal diseases) were highly prevalent in a population of internal medicine inpatients and that 84% of the affected patients wished to receive dermatological treatment. The treatment of readily responsive dermatoses could improve the quality of life of the patients. Xerosis cutis is a common problem in the elderly and was the most prevalent condition for which patients requested treatment. Xerotic lesions often occur on the legs and are aggravated by low humidity, central heating and excessive washing [7]. Xerosis cutis can be effectively treated with emollients, moisturizers and (if inflammation is present) low- or moderate-potency topical steroids. Given that the present study was performed in the winter, dermatoses like xerosis cutis are probably somewhat overrepresented. Thus, our prevalence data cannot be generalized to the rest of the year. The study population showed a male predominance (60%) but this ratio corresponds well to our department's typical active case file (56% male and a mean age of 60 over the period 2007–2009).

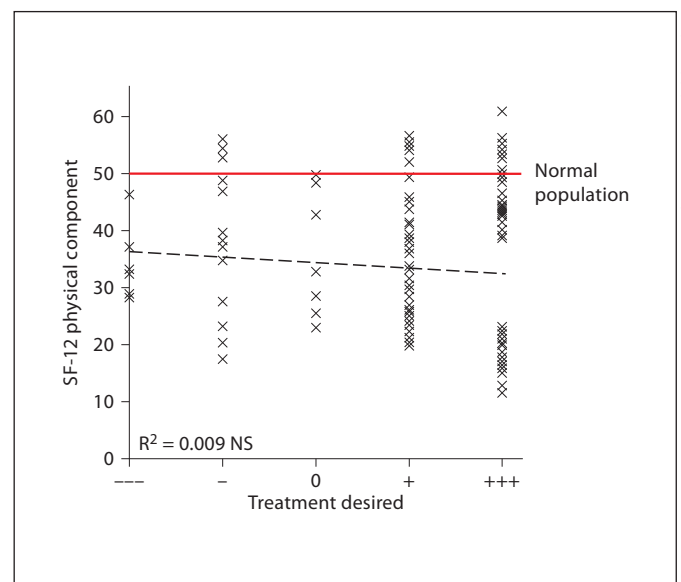


Fig. 5. The absence of correlation between physical quality of life impairment and the wish for dermatological treatment.

This study revealed that common skin pathologies will not always be treated in a hospital stay. None of the patients with xerosis had this problem in the list of diagnoses to be addressed during the hospital stay. In our opinion, this is due more to the prioritization of health problems than poor care by the attending physicians. Nevertheless, an internal medicine physician may not recognize dermatological problems or consider them to be important. Furthermore, other explanations might be that internal medicine physicians do not ask inpatients about preexisting skin conditions or patients are unaware that their skin disease could be treated and thus failed to mention it on admission. Therefore, we suggest that all patients admitted to internal medicine departments should be asked about their dermatological medical history.

Although one can legitimately ask whether the observed dermatological conditions were causally related to internal diseases, we did not find any evidence of this in

our study population [8–15]. However, the present study sought to identify dermatoses with a high prevalence; with a larger sample size, rarer internal disease-related dermatoses might be detected.

In summary, all the patients admitted to an internal medicine department in early winter had some sort of skin problem and more than three quarters expressed the wish for dermatological treatment. All the dermatoses for which the patients requested treatment were symptomatic, such as xerosis cutis. Hence, better collaboration between internal medicine physicians and dermatologists might be welcomed by patients and might increase the latter's quality of life.

Disclosure Statement

None of the authors have conflicts of interest to declare.

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